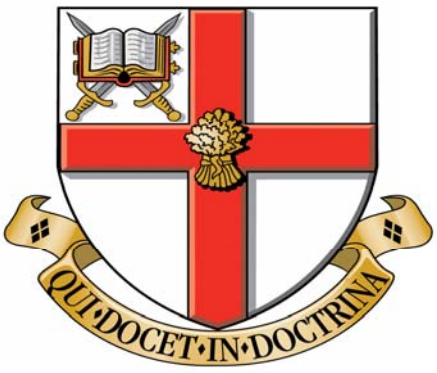


University of Chester



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# Analysis of Information Systems Value and Formulation of Investment Appraisal Framework Strategy in the context of Local Government in Wales

**Stephen Jones**

**M.Sc.** **1998**

# Analysis of Information Systems Value and Formulation of Investment Appraisal Framework Strategy in the context of Local Government in Wales

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**in part fulfilment for the degree of**

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**by**

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## CONTENTS

***This work is original and has not been submitted***

***previously in support of a degree qualification or other course***

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# Analysis of Information Systems Value and Formulation of Investment Appraisal Framework Strategy in the context of Local Government in Wales


## Abstract

Local Authorities have the responsibility of delivering a wide range of services to the general public and have a number of significant problems in many service delivery areas. The Information Technology and Information Systems field is arguably the most challenging. A current information systems issue within the author's sponsoring organisation - a new Welsh Unitary Authority - is getting value from IS investment.

The Authority has recently implemented an organisational-wide Office Automation (OA) system. This system was introduced to consolidate and integrate the many departmental systems, working environments and business cultures. Although individual users appeared comfortable with existing departmental paper and technology based OA arrangements, there was no corporate OA environment and it was difficult to communicate and share information. It was perceived that this situation was both inefficient and ineffective. The corporate OA system was therefore introduced to deliver a coherent business information system on a single information technology platform, across a large geographical area and several organisational sites. This initiative had the key objectives to improve information flow, working arrangements and organisational efficiency.

This dissertation investigates the rationale for the implementation of an organisational-wide, corporate OA system and investigates and analyses how IS value and benefit was defined and measured. This task has enabled the author to utilise the skills and knowledge gained on the MSc Information Systems degree course. Upon completion of the research dissertation, IS value has have been defined, identified and analysed with regard to a specific case study situation. An IS Investment Appraisal Framework Strategy has been proposed for the Local Authority. This could have a direct benefit to the author's organisation and may assist others in the future.

# Chapter 1

# Introduction

There is a growing awareness that the implementation of new technology and office information systems forms an integral part of the provision of organisational services and therefore is a key and vital resource (Anderson, 1998). The effective deployment of Office Automation (OA) systems is an important element in establishing an electronic workplace environment and transforming the capabilities of a modern organisation and its workforce (Popel, 1997; Galliers and Baker, 1997). OA can empower users to streamline business processes by communicating, sharing and adding value to business information (Hirschheim, 1995). Hirschheim (1997) further contends that achieving successful OA implementation is complex. It requires a holistic view of diverse technologies, together with enterprise perspectives on organisational strategies, while balancing the demand to respond to the emergence of new technologies and organisational cultures.

To achieve successful implementation of a system that will be utilised by an organisational workforce, it is increasingly becoming recognised that potential future users must be consulted (Lyytinen, Klein, and Hirschheim, 1996). This approach helps ensure ownership and therefore successful implementation of the technology, to help achieve organisational objectives.

However, against this philosophy, there is widespread concern in organisations that investment in IS does not deliver value and that many projects do not meet business objectives. This issue is of major concern in the authors' sponsoring organisation. Information systems expenditure is regarded as costly and risky (Robson, 1997). However, many IS investments appear to go

ahead without the use of formal investment appraisal and risk management techniques (Ward, 1998). Often, the specification and implementation is left to IS professionals only, with little or no involvement from organisational management or the user community, which can lead to ineffective or failed IS (Sauer, 1993). Earl (1996) has further suggested that if IS implementation is left to IS professionals and users alone, then the investment is rarely recouped.

Any investment in new technology should be examined for its business value and benefit to the organisation (Galliers and Baker, 1997). Frequently, many IS investments proceed without management processes to measure the achievement of the specified outcome and similarly, no process to evaluate what benefits were actually achieved (Ward, 1998).

The author's employing organisation, a Local Authority, has recently implemented an organisational-wide OA system. This system was introduced to consolidate and integrate the many departmental systems, working environments and business cultures. There was a perception that the introduction of OA would improve efficiency and effectiveness of the organisation. The corporate OA system was therefore introduced to improve the prevailing situation. The intention was to deliver a coherent business information system on a single information technology platform, across a large geographical area and several organisational sites. The key objectives were to improve information flow, working arrangements and organisational efficiency.

This dissertation project will examine, via a case study, how IS investment is often initiated and undertaken, and develop a good practice framework to help assess the value and benefit

of IS to help ensure it meets the required outcome. The result of this research dissertation may have a direct and real benefit to the author's employer.

The author is not concerned with the of specifics of IS assessment metrics, detailed benefit measurement formulae, evaluation concepts or cost benefit analysis techniques, but rather with the high level, key strategic issues that have emerged from the case study which must be addressed to ensure the organisation obtains maximum value from the implementation of new technology.

The report is structured to prepare, convey, discuss and link argument and findings. A literature survey to obtain an academic perspective on OA, and IS Value and Benefit is presented in chapter two. This literature review suggested a research methodology that is case based. To enable the richness of the situation to be obtained a qualitative methodology used in IS practice, Grounded Theory, was chosen. The methodology, approach and problem solving strategy, is described in chapter three. Using the chosen research methodology and problem solving strategy, the case study was investigated, which enabled key emergent themes to be extracted from the prevailing situation. This is described and analysed in detail using tools and techniques from IS practice to assist with this process, in chapter 4. During the analysis lessons were learnt by the author which enabled the formulation of a proposed future generic strategy framework. This is discussed in chapter five. Conclusions derived from the dissertation are discussed in chapter six. Finally, a reflective critical evaluation of both the project and the author is undertaken in chapter seven.

## 1.1. Objectives

This section describes the specific objectives of the research dissertation. The stated objectives of the dissertation are:

1. Perform a literature survey to establish an academic perspective on Office Automation and IS Investment and Value.

2. Describe in detail a case study and identify issues associated with this specific situation.

3. Analyse and evaluate the key issues from the case study.

4. Formulate a proposed good practice framework for defining and measuring IS Investment and Value for the Local Authority.

5. Undertake a Critical Evaluation of both the dissertation and self.

The potential relevance to interested groups can be summarised into two categories. Firstly, from the OA and IS value perspective. This research dissertation may be of relevance to other Local Authorities and organisations who are facing similar situations. Ward (1998) has argued that further research is necessary to understand IS value and benefit and therefore this assignment may also be relevant to the academic world for reference.

Secondly, from the Research Methods and Grounded Theory perspective, this project will be of interest to parties investigating and studying the appropriateness of Qualitative Research Methods in general, and Grounded Theory in particular, as a valid IS research methodology to develop IS theories.

The first major task of the project was to undertake a literature survey to obtain an academic perspective on OA and IS value and benefit. This is discussed in the next chapter.

# Chapter 2

# Literature Survey

This chapter presents the underlying rationale and scientific and technological issues of OA. It highlights the potential practical and socio-economic benefits of OA and discusses the relevance to users. The chapter also presents the rationale and historical perspective of IS value and its relevance to organisations. Finally, it identifies IS/IT tools and techniques to assist with the case study analysis.

## 2.1. Office Automation

Office Automation has been heralded as the solution to a myriad of problems associated with the modern day office. However, there is no universally accepted term to describe the application of new office technology, neither is there a universally accepted definition of OA. Any definition should be broad enough to embrace the entirety of the subject, yet specific enough to exclude those aspects which are outside its bounds. Such a definition of OA is offered:

> "office automation refers to the application of integrated computer, communication and office product technologies and social science knowledge to support the activities and functions in an office environment" (Hirschheim, 1997).

Hammer (1997), contends that OA differs from traditional Data Processing (DP) in three main ways. Firstly, DP handles structured data, for example, a payroll number for a member of staff. This would be identical in structure to all other payroll numbers. In contrast, OA supports unstructured information, not predictable in length or format, for example, notes made of a telephone conversation.

Secondly, DP will generally only support numbers and text, whilst OA will support all information types, including pictures, graphics, voice messages and video footage. This mixed information is referred to as multi-media. An example of this could be a visit report that a Social Worker has created. This might contain some hand-written notes, and perhaps a photograph of a building.

Thirdly, DP normally has predictable, cyclically determined tasks to perform which generate pre-determined output. This may be the production of payslips, a report, or a listing of all cheques paid in the previous month. This predictability is often built into the computer programs. The same output is produced every time the program is run, and the reports are given to the same people. By contrast, OA is not 'programmed' in this way. It is often a 'filing cabinet' of information made available to people who have permission to use it. It is also individual users who decide what information to store and when, and to whom, information should be sent.

OA data is, therefore, shared, text intensive, unstructured, highly interactive and constantly changing. OA systems that utilise this data differ from the traditional DP systems - which

perform data capture, data process and data output - in that they facilitate the process of deliberation, debate, decision support and worker co-ordination (Uhlig, Faber, Bair, 1995).

In short, OA is an integrated information resource system and is illustrated in the figure below:

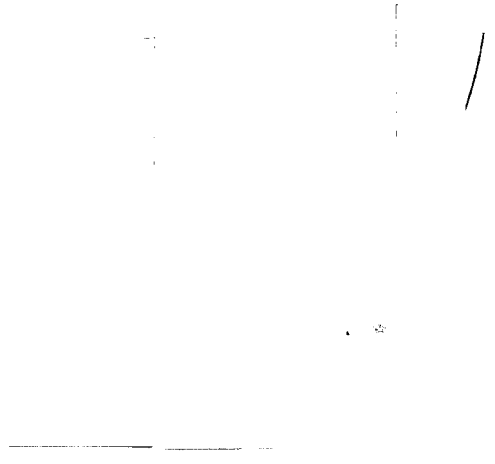

Figure One: Office Automation - an integrated information resource system (Hirschheim, 1997).

A fuller definition of OA is contained in Appendix B.

The philosophy and rationale of OA is unique, and different to that of traditional IS/IT applications. Hirschheim (1997) contends that the nature and role of computerised information systems and their importance in organisations have undergone substantial transition since their introduction in the late 1950s. Both the technology, and the way it is viewed, managed and employed has changed considerably, with a shift away from traditional IS/IT functions towards End User Computing (EUC). End User Computing functions include the full range of information management and retrieval systems, decision support systems, user application development and perhaps most importantly, OA systems (Meyer, 1996).

There is an increasing demand for organisations to become more efficient and effective. To assist with this process, organisations are recognising the increasing importance of accurate, timely, shared and integrated information. This has driven organisations to move to more distributed, dynamic and flexible organisational models, with physical office boundaries rapidly being dismantled and organisational staffing structures being radically changed (Klein, 1996).

This shift of emphasis, away from discrete, monolithic and function specific software products and hierarchical management structures has required organisations to establish the interaction, communication, and collaboration needed to maintain the continuity of work processes. The philosophy, rationale and application of OA is a key contributor to this goal, and has a very important role which can help shape the environment and culture of an organisation (Klein, 1996).

The focus of OA therefore, is on the distributed workforce with its primary emphasis being the work processes of the business, not the professional tasks of individuals. The main objective is to reduce administrative overheads and establish an efficient and effective electronic workplace for information based businesses and organisations through the medium of OA.

From the historical perspective, Hirschheim (1997), has proposed that there has been a slow but controlled evolution in the use of OA in most UK organisations during the past 25 years:

| | | |
|---|---|---|
| - | initial use of Electronic (not Electric) typewriters | early 1970s |
| - | introduction of proprietary Word Processing systems | mid 1970s |
| - | introduction of Mainframe OA services (mainly IBM sites) | late 1970s |
| - | introduction of proprietary mini-computer based OA | early 1980s |
| - | introduction of standard (Unix) minicomputer based OA | mid 1980s |
| - | introduction of PC based personal OA facilities | late 1980s |
| - | introduction of OA Local Area Network (LAN) services | early 1990s |
| - | consolidation of OA into a multi-tiered corporate service based upon client-server computing architectures | mid 1990s |

This view is generally accepted throughout the IS/IT academia and industry and further supported by Meyer (1996) and Klein (1996). The history of OA and the current academic viewpoint (Hirschheim, 1996; Anderson, 1998; Klein, 1996) also suggests that in the future OA will continue to expand as new technologies emerge.

Panko and Sprague (1994) propose four models through which OA may be viewed. The first model views OA simply as an extension to the DP function, updated to take account of new hardware and software. The second model focuses on the concept of the paperless office, whereby basic information handling tasks have been automated with the aid of computer-based tools. The third model aims at assisting managers and professionals who predominantly handle unstructured tasks - the knowledge worker - with powerful and intelligent tools which allow information manipulation to be performed. The final model is that of decision support, whereby decision makers are provided with the tools that assist them in accessing and analysing information and also support an unstructured or semi-structured decision process. This dissertation is concerned with the functional description contained in the last model, because it is this model that prevails in the organisation to which the case relates.

Information technology and computer based information systems have traditionally been conceived as a means of managerial and social control primarily because they possess the power to direct, command and restrain (Briefs et al 1993). However, it is increasingly becoming recognised that IS/IT is now first and foremost an enabling technology which can be embraced by the workforce to promote and support emancipation (Lehtinen and Lyytinen, 1995). There is a growing trend for people to want more autonomous work environments and to participate in the decision making process. Evidence for this can be found in the Scandinavian tradition (Kling, 1994). Consequently, the social perspective of IS/IT is increasingly becoming an important issue. The implementation of OA can have a large impact, and can influence the way an organisation undertakes tasks and the prevailing organisational culture.

The application of office technology is increasingly perceived as less of a technical innovation, rather a social one, with the risk of unsuccessful IS implementation being potentially great. As a result, the implementation of new technology must not ignore the social aspects. This is crucial in minimising the potentially deleterious social consequences. Implementation should ensure that new technology meets user requirements and gains user acceptance (Lyytinen, Klein and Hirschheim, 1996) a fact which history has shown is neither easily achieved or well understood.

It has been widely predicted that OA and emerging technologies will become a more visible and important force in our office society of the future. The ability to apply OA to a variety of tasks within the office will continue, with the resultant accelerated rate of change in the development of office technology and systems (Lyytinen, Klein and Hirschheim, 1996).

## 2.2. Information Systems Investment, Value and Benefit

The implementation of new technology forms an integral part of the provision of organisational services and therefore is a key and vital resource (Anderson, 1998). The deployment of IS has been heralded as the solution to a myriad of organisational and business problems (Popel, 1997). Many proponents of IS claim the implementation of IS is can resolve many complex business problems, and can deliver real competitive advantage and organisational improvements (Hammer, 1997; Robson 1997).

Critical assessment of the implementation of certain IS has clearly demonstrated that it is possible to solve problems and yield competitive advantage (Porter and Millar, 1985; Ives and Feeny, 1990). There are many well documented examples, such as the analysis of the American Airlines reservation system (Copeland and McKenny, 1988) and Xerox (Remenyi, 1991).

However, although computerisation has generally been welcomed by most business participants, organisations and observers, there has always been a certain amount of scepticism about its real benefits (Earl, 1996). There is now growing concern, especially amongst top executives, about the casual approach to what has been traditionally regarded as an extremely high level of investment and expenditure (Earl, 1996; Remenyi, Money and Twite, 1997). Many Chief Executives are becoming more and more uncomfortable about the rate of IS spending and increasingly frustrated by their inability to find appropriate measures with which to evaluate its performance (Ward, 1998).

From the historical perspective, attitudes towards IS benefits have been described in three phases (Remenyi, Money and Twite, 1997), which coincide with the three distinct stages of IS evolution categorised by Sprague and McNurlin (1996) as the automate, informate and transformate three era model:

1. Transaction Processing Systems (TPS) to improve efficiency
2. Management Information Systems (MIS) to increase effectiveness
3. Strategic Information Systems (SIS) to improve competitiveness

During the automate phase in the sixties and early seventies, the emphasis of computerisation was placed on reducing the labour required for the manual aspects of clerical work. The main perceived result of this initiative was the reduction of routine and tedious work with the primary benefit being greater speed and accuracy of paper handling, resulting in better customer service and perhaps reduced costs.

Systems in this automate phase are generally referred to as transaction processing systems (TPS), an example being a computerised payroll system. The purported benefits were a controversial issue. In fact, in these early days of computerisation, it was often said that computers were acquired so that companies could demonstrate a modern approach to business. Increased profit, cash flow or return on investment were generally not considered. Indeed, it was often stated that computerisation did not actually save money, but rather changed the way companies worked.

For example, the original objective of reducing headcount through computerisation of clerical tasks, resulting in loss of clerical and administrative staff, was counter balanced by the need for a new breed of employee - the programmer and analyst. The benefits were described as being more to do with increased and improved capacity, accompanied by the issues such as less errors, greater reliability of data and prestige (Remenyi, Money and Twite, 1997). Nonetheless, despite the frequent lack of any real measurable payoff, there were surprisingly positive attitudes towards computing during the automate phase, with most businesses and observers believing that computers had a beneficial effect (Sprague and McNurlin, 1996).

During the second, informate, stage in the late seventies and early eighties, computers were used to deliver extensive management reports which were intended to facilitate more effective management and control. These reports presented regular and routine descriptions of how various aspects of the business were performing. These systems, called management information systems (MIS) provided sufficient information for managers to be able to make important contributions to improving the organisations efficiency. However, impact on the organisations effectiveness was not necessarily delivered (Gibson and Jackson, 1990). Decision Support Systems and Executive Information Systems followed MIS, but again with little real measurable benefit in the business effectiveness area (Remenyi, Money and Twite, 1997).

This second phase was not without achievements and systems were delivered which sometimes dramatically improved the efficiency with which various functions were performed within an organisation. Therefore, achievable benefits in this phase of computerisation may be attributed to savings obtained through applications such as better stock control, improved sales forecasting and better cash flow. Jackson (1986) suggests that vendors generally exaggerated the payoff as it related to improving business effectiveness, but organisational efficiency continued to improve.

During the late eighties and nineties there have been claims that it is possible to radically change the way an organisation does business via the deployment of IS (Hammer, 1990). These information systems intend to transform the function of the actual business or organisation. This is the third phase and the term transformate has been applied to describe what may be achieved by the use of these systems. They are also referred to as Strategic

Information Systems (SIS). These systems are frequently based on wide area networks and are corporate, in that they rely on the strategic nature of data and communications to develop and improve efficiency, effectiveness and competitive advantage.

It is the SIS category that OA falls into (Hirschheim, 1997). Hammer and Champey (1993) contend that the potential benefits delivered by the strategic information system can be enormous. However, it is also claimed they can deliver no benefit, and indeed dis-benefits, and actually put the organisation at a disadvantage (Earl, 1996). Indeed, Earl (1996) further contends that if IS implementation is left to IS professionals and users alone, then the investment is rarely recouped. Recent research suggested that vendors, consultants and academics generally trend to exaggerate the ability of IS to transformate (Remenyi, Money and Twite, 1997).

Although the three phases of automate, informate and transformate may be seen as the historical development of IS, all three are currently relevant. Any contemporary organisation which is effectively exploiting its IS potential will be using all three types of approaches to IS (Remenyi, Money and Twite, 1997).

Throughout the nineties the IT industry, management consultants, and academics have continued to suggest that IS can transform the way an organisation functions and that business and organisational processes can be re-engineered via the use of IS (Hammer, 1997). It has also been suggested that societies and organisations in the future will depend on global IS infrastructures, that groupware is the key to levering managerial and professionals knowledge, and that telecommunication networks are creating virtual organisations, businesses, markets

and opportunities (Remenyi, Money and Twite, 1997). Morton (1995) has documented the changing nature of organisations and business with regard to the implementation of IS and concurs with this view of the future.

Any investment in new technology should be examined for its business value and benefit to the organisation (Galliers and Baker, 1997). Information systems expenditure is regarded as costly and risky. However, many IS investments appear to go ahead without the use of formal investment appraisal and risk management techniques (Robson, 1997).

Establishing the value and benefit of IS to a particular organisation may not affect the overall outcome of the system in terms of functionality or acceptability. However, Anderson (1998) asserts that it is vital to establish the significance of IS, give credibility to its introduction and ensure that it is aligned to business strategy. This will demonstrate to Senior Management that the IS implementation should deliver benefits to the organisation.

A primary concern of many Chief Executives is how does an organisation 'Get value for money from IS' (Price Waterhouse Review, 1996). This issue has emerged primarily due to the increasing level of IS expenditure experienced by many business and public sector organisations. There is now greater cynicism about IS benefits that ever before (Remenyi, Money and Twite, 1997). Research finding indicate:

1. 70% of users declared that their systems were not returning their company's investment (Romtech, 1989).
2. IT overhead costs are consistently larger than anticipated (Kearney, 1987).

3. Only 31% of companies report that the introduction of IT has been very successful (Amdahl, 1988).
4. Only 24% of companies claim an above average return on capital investment (Hochstrasser and Griffiths, 1990).
5. 20% of IS spend is wasted and 30-40% of IS projects realise no net benefits whatsoever, however measured (Willcocks, 1991).
6. Approximately 42% of corporate IT projects get abandoned before completion (Standish Group Survey, 1996).
7. Approximately 50% of all IT projects fail to meet Chief Executives' expectations (Flood, 1998).

Given the significant world-wide expenditure on IS/IT these findings are worrying.

Virtually every IS initiative has an associated cost, in terms of hardware, software, staff an services. This research indicates that there is a significant amount of wastage from IS investment. Ward (1998) highlights that out of a random sample of twenty organisations who were asked how they ensure that benefits claimed were realised, only one could demonstrate a clear, documented process. Evaluation of IS investment therefore, is an important issue in organisations which is often overlooked. From the author's perspective, the implementation of a complex organisational-wide OA system is both costly and risky, and significantly, may not yield any real benefit to the organisation.

## 2.3. Tools and Techniques

Tools and techniques from the IS/IT domain have been researched, reviewed and selected to assist with the case study analysis in section 4.3., where appropriate. They are introduced and described briefly here. A fuller explanation is given in the relevant section.

A model for cost or value benefit as proposed by Ward (1998) identifies indicators to assist with IS value and benefit measurement. This modelling technique is used to assist with cost benefit analysis in section 4.3.2.

The application portfolio approach proposed by McFarlan an McKenney (1992), is a dynamic and qualitative method and classification framework for strategic analysis. Based on the product life cycle and the Boston Consulting Group Matrix, it is a predictive tool which provides a snapshot and assessment of the current situation. This, in turn provides pointers to the desired portfolio and helps develop strategy. Generic Strategies, proposed by Parsons (1990) can then be mapped onto the portfolio to improve the overall picture. This model is used for strategic analysis in section 4.3.3.

Another technique, categorising EUC maturity by the level of End User autonomy, reflects the level of IS/IT maturity in an organisation, which can ultimately help organisations manage the EUC and OA function. A 4-stage model has been proposed (Robson, 1997). This model is used to examine and understand the IS/IT/EUC/OA maturity of the organisation in section 4.3.4.

## 2.4. Summary of Literature

Work to date suggests that successful implementation of SIS such as OA can offer significant benefits to an organisation (Hirschheim, 1997). However, although there are many claims for the benefits derived from the deployment of IS (Hammer, 1997; Robson 1997), there are seemly equal number claims of poor return of IS investment (Wisemann, 1995; Ward, 1998).

Until recently, little attention has been given to methods that demonstrate how the value and benefit of IS defined and measured, especially within the public sector domain. There are few formal IS appraisal frameworks to assist in the evaluation of IS deployment (Ward, 1998).

There is clearly some doubt as to whether IS investments are delivering the expected or achievable value and benefit. Given that very few organisations have any form of process to overtly manage the delivery of value an benefit, it is difficult determine whether they are achieving maximum value from the investment (Earl, 1996).

This dissertation investigates the prevailing scenario in the author's organisation, in the form of a case study analysis of the rationale for the implementation of an organisational-wide, corporate OA system and investigates and analyses, using tools and techniques to assist where appropriate, how IS value and benefit was defined and measured.

It is evident from the literature survey that the nature of OA and of IS Value and Benefit is unstructured and people orientated. This leads to a research methodology which is essentially qualitative. This research methodology is discussed in the next chapter.

# Chapter 3

# Design Study

This chapter discusses the design of the research dissertation case study in terms of the research methodology and approach and the justification and management of resources. A research plan is contained in Appendix A.

## 3.1. Research Methodology and Approach

As discussed the literature survey, in section 2.1., OA and IS Value and Benefit has a 'soft' focus, in that it is unstructured and people orientated. To obtain a valid situation audit and identify future OA requirements therefore, it was necessary to choose a qualitative research methodology.

The strongest justification for a qualitative, field orientated approach for this research dissertation comes from the methodological literature on information systems research. This highlights the need for an increase in field-based methods (Baskerville and Wood-Harper, 1996) as certain categories of knowledge cannot be acquired through traditional quantitative methods (Swanson and Swanson, 1990).

This literature demonstrates the need for case studies where 'the primary research data are the concepts employed by the actors in the field and where the researcher wants to know how the

different actors involved understand and use information systems' Nissen (1991). This is particularly true of OA and IS value and benefit where the focus is not on analysis and prediction, but rather interpreting human action and perceptions to develop an understanding of social and human aspects of IS.

Having reviewed several possible qualitative research methodologies for this research proposal, the particular methodology chosen by the author is that of *Grounded Theory* (Glaser and Strauss, 1967). The main justification for using Grounded Theory (GT) arises from its methodological perspective. GT was developed in the domain of health and social science research to counteract the heavy emphasis of traditional research on theory testing and insufficient attention to generating meaningful, field relevant theories. Glaser and Strauss adopted a generic strategy of comparative analysis commonly employed in sociology and anthropology and developed a set of procedures for analysing the rich qualitative interview-type data typically encountered in field research.

The GT approach was explicitly designed for researching organisational issues and problems on which 'no relevant theory exists or where the theory may be too remote and abstract to offer much detailed guidance' (Swanson and Swanson, 1990). Segev (1988) further explains the use of GT by suggesting that its use is appropriate when 'current investigations suffer from the lack of an accepted framework for research'. It is interesting to note that the health research scenario in which the GT approach was developed, closely resembles the state of much IS research today (Baskerville and Wood-Harper, 1996; Robson, 1997). Further justification for using GT for this research proposal is that the applications of GT in IS

research have been almost exclusively in corporate policy and strategy (Burgelman, 1996), and clearly this dissertation subject area, OA strategy and IS value, falls into this category.

Grounded Theory is a field based, 'discovery' qualitative Research Methodology, which allows the researcher to develop an account of the research subject by empirically investigating the subject from a user orientated and organisational perspective. It enables the researcher to deal with non-standard data and facilitates the collection, analysis and reportage of qualitative data, thus providing an accurate, rich account of the area under study (Weingand, 1993). The research methodology assumes that the emerging theory is 'grounded' in the research data.

Grounded Theory is well suited to research situations which deal with "qualitative data of the kind gathered from participant observations, face to face interaction, semi-structured or unstructured interviews" (Toraskar, 1991). Mumford and Weir (1983), Corbin and Strauss (1990) and Baskerville and Wood-Harper (1996) have demonstrated the value of interview based field research in the context of IS.

Grounded Theory supports inductive research whereby the researcher develops more than just a descriptive account (Swanson and Swanson, 1990). GT incorporates an iterative approach , whereby the initial data analysis is used to shape continuing data collection. The methodology is particularly useful for exploratory research where rigid and well controlled experimental design is not possible (Calloway and Ariav, 1991), such as this dissertation subject. A hidden benefit of this approach is that it increases creativity and enhances enthusiasm to continue searching to confirm findings.

Although used extensively within the Social Sciences, GT is becoming increasingly used in IS research to accommodate complex qualitative data variables and inherent complexities of IS research such as the Political, Social and Economic dimensions. Pries-Heje (1991) contends that Grounded Theory has the following main advantages:

1. The analysis of data is well documented so it is possible to trace the derivation of any category / hypothesis back to concepts, coding memos and the actual transcripts of interviews.

2. The approach provides a solid foundation for subsequent survey work, thus avoiding quantitative evidence of intuitively developed concepts that are imperfect.

3. It allows the data to play a prominent role in determining categories and hypothesis.

Glaser and Strauss (1967) conclude that the primary aim of Grounded Theory is to:

1. accurately and richly describe the subject of study, through the process of concept discovery

2. formulate ideas about the relationships between the observed factors

And they define Grounded Theory as:

> "An inductive, theory generation methodology that permits the researcher to develop concepts, ideas and theories by grounding the observations in qualitative data"

This argument shows that GT is an appropriate research methodology for the analysis and formulation of corporate OA strategy through information gathering based upon semi-structured interviews.

The basic process for generating theory is *comparative analysis.* This is a procedure where properties and categories identified from the interviews are refined by comparing facts for similarities and differences. Accuracy in the sense of richness, not in the sense of perfectly precise description, is the primary concern of comparative analysis. The emphasis is on establishing the boundaries of fact, for example, how pervasive a notion is, or how universal is an observed concept.

The size of the interview sample is also idiomatic in that one case can be instrumental in generating valid theory and a few more cases can further confirm it. When data appears to provide no more information for a category, the category becomes saturated. However, if more useful information is elicited from subsequent interviews or analysis, the categories may be partitioned or combined; properties may be added or merged and relationships can be refined. Thus, the theory becomes derived from a dynamic body of knowledge that is grounded in the data (Weingand, 1993).

The proposed methodology therefore, for the OA research subject, involved informal interviews with key staff, who were identified in conjunction with the Chief Executive and the Authority's board of Directors. The interviews were semi-structured (Appendix E) and interviewees were encouraged to comment, and to raise, reveal and suggest issues and problems which they regarded as important to the subject in question.

These interviews were subsequently transcribed and analysed using an intuitive approach based on Grounded Theory. As discussed above, this is an inductive, discovery methodology that allows the researcher to develop an account of the general features of a topic while simultaneously grounding the account in empirical observations. The analysis involved identifying categories from the transcripts which were then compared with each other and abstracted to higher levels of category to produce a complex and a 'rich' view of the situation, together with emergent themes as described by the interviewees.

The approach depends on using the interviewees own words to describe the situation, and then subsequently agreeing with the interviewee that the account that emerges is a valid and accurate representation. Starting with one account per interviewee, common themes are identified which are drawn together to formulate the prevailing view. This 'rich picture' of a problem situation, is similar to that defined within Soft Systems Methodology (Checkland, 1981), but based upon the essence of Checkland's approach, rather than the methodology. The essential focus of the research methodology is a search for a particular view or views. This *Weltanschauung* (Assumptions or World View) is then extracted to describe and help understand the problem situation.

The approach required the collection of empirical evidence, from a variety of sources, in relation to the case study. The primary aim was to accurately describe the subject of study, through the process of concept discovery, and to formulate ideas and hypotheses about the relationships between the observed factors. The concepts and views generated were regarded simply as more or less useful and not more or less true or valid.

To conclude this section therefore, the main elements of the Case Study were:

(1) Interviewing Senior IT Officers and members of the Corporate Information Technology Client Group (CITCG). During these sessions two main findings emerged:

(i) an understanding of how the OA facilities were initiated;

(ii) an understanding how the value and benefit of OA was evaluated to ensure it met the needs of each department's OA users.

(2) Interviewing a number of Directors and other Senior Staff within the Authority. During these sessions three main findings emerged:

(i) the interviewees views of the OA services currently provided and identification of their perceived value and benefit of the OA solution, different from those articulated by the senior IT staff and the CITCG ;

(ii) an understanding of what senior officers and key users believed 'OA' actually was, and how this interfaced with other IT services available to them;

(iii) identification of what value and benefit individual Directorates needed from the implementation of OA to fulfil their requirements covered by the Service Delivery Plans.

(3) Communicating with a small number of key OA suppliers (see appendix D) to obtain guidance on current and future directions for OA products and services.

(4) Evaluating lessons learnt from Public Sector OA pilot studies run in the 1980s and 1990's, which are still very relevant today.

(5) Reviewing published articles and academic research papers to identify attributes that contribute to the success or otherwise of OA implementations.

The research methodology enabled a broad, high level picture to emerge from the scenario.

A total of 20 staff consisting of at least one representative from each department within CCBC were interviewed individually. Some staff were seen on more than one occasion. The decision to interview a large number of staff representing the full spectrum of service departments throughout the Authority was deliberate, to enable a broad view to emerge and to assist with the process of comparative analysis.

The staff interviewed are listed in figure two below:

| Name | Department | Designation |
|---|---|---|
| Rona Aldrich | Libraries | County Librarian |
| Derek Barker | Chief Executives | Chief Executive |
| Barry Bond | Technical Services | Assistant Director |
| Rob Brookes | Information Technology | IT Systems Manager |
| Arwyn Davies | Property Services | Assistant Director |
| Peter Detheridge | Planning | Assistant Director |
| John Dowle | Highways | Director |
| Geraint Edwards | Technical Services | Principal Engineer |
| Ron Evans | County Secretary | Director |
| Gareth Griffiths | Building Control | Assistant Director |
| Alan Jones | Information Technology | Projects Manager |
| Dewi Jones | Legal | Chief Legal Officer |
| Bob Newton | Planning | Principal Planner |
| David Peel | Highways | Assistant Director |
| Charles Phillips | Environmental Health | Assistant Director |
| Joan Smith | Public Protection | Environmental Health Manager |
| Paul Ubysz | Information Technology | IT Services Manager |
| Alan Voyzey | Education | Assistant Director |
| Graham Wild | Planning | Director |
| Cledwyn Williams | Social Services | Director |

Figure Two - Staff Interviewed.

## 3.2. Design Study Stages

The design study stages followed the steps as documented by the Grounded Theory methodology. The case study therefore, was categorised into the following steps:

1. Identify Data Sources
   - (i) design semi-structured questionnaire
   - (ii) identify people and groups to sample

2. Theoretical Sampling
   - (i) perform and transcribe interview
   - (ii) make notes and reference the data
   - (iii) identify and classify concepts and ideas

3. Theoretical Coding
   - (i) compare incidents, concepts and ideas
   - (ii) integrate data
   - (iii) generate hypothesis about problem(s)

4. Memo Generation
   - (i) identify hidden meanings in statements
   - (ii) verify hidden meanings with interviewee
   - (iii) develop ideas from verified hidden meanings

5. Theoretical Sorting

   (i) sort theoretical coding and memo generation by similarities

   (ii) integrate into a theoretical outline

6. Theoretical writing

   (i) write theory about relationships and concepts

## 3.3. Justification of Resources

The resources required for this dissertation were not significant. The requirements were restricted to appropriate training for the researcher, a dissertation supervisor to facilitate mentoring and progress monitoring of the researcher as recommended by Bright (1991), and time, which was committed by both the researcher and the interviewees. There were no specific physical resources or quantitative analysis tools required. IT equipment requirements were simply the use of a PC, word processor and project management software. Time was the most important factor.

## 3.4. Management of Project and Resources

This section discusses the management of the project and resources. Project and resource management is an activity which can be defined as a cycle of setting objectives, making plans, producing and reviewing results (Lock, 1986). There are three distinct stages in project

planning - creating the project, managing the project and monitoring the progress. It is important to set objectives, define the scope, establish a strategy and breakdown and structure the work.

Critical path analysis is an aspect that shows relationships between different parts of the project. Should anything happen to delay the critical path once the project has started, then the end date will increase. Risk analysis and contingency planning, usually associated with project planning, is not an especially important aspect to this research project, but needs to be considered.

Perhaps the most important aspect of any research project is the skills of the project manager, who sets objectives, plans, organises, and controls the project. In this case it is the researcher who is the project manager and is he who will interpret information and react to situations as they are presented to him. It is important that the researcher is motivated and committed to the project.

Information and estimates must be analysed and the use of a good project management tool, such as Microsoft Project Manager will assist in the planning and controlling of the research project. Software will highlight areas where targets have not been reached, help investigate why and set new targets. Once targets are set, progress towards these targets can be monitored and alternative courses of action must be considered.

To conclude this section, the following tools, training and resources were identified:

- A good project management tool - 'Microsoft Project'
- Project management training for the researcher
- A PC and word processing facilities
- Questionnaire design training for the researcher
- Grounded Theory documentation and literature
- Interviewing skills and techniques training for the researcher
- Commitment and time given for the interviews by the Interviewees

The above requirements were met and satisfied the needs of the dissertation.

# Chapter 4

# Case Study

This chapter discusses the specific case study situation. The justification for the chosen case study scenario is described in section 4.1. As discussed in the research methodology, information for the case study assessment was gained through interviewing CCBC staff, communicating with OA suppliers, evaluating lessons learnt from other Public Sector OA pilot studies and reviewing published articles and academic research papers. Using the research methodology, an assessment has been undertaken of the implementation and use of OA at CCBC. However, a full and detailed audit of usage was not performed, as the purpose was to identify a 'rich picture' of fundamental and key issues, in terms of functional and social aspects and significantly, in terms of IS value and benefit. This is discussed briefly in section 4.2.. This section also describes key themes identified by the author that emerged during the case study. These form the basis of the case study analysis, discussed in section 4.3.

## 4.1. Case Study Justification

The literature survey performed in chapter two suggested a research approach which is case based. Markus (1987) contends that it is important that careful consideration is given to the rationale for selecting a particular case study for a specific situation. Following a review of several candidate systems that have been recently implemented in the author's sponsoring organisation, the OA system was selected.

This system was chosen because it appeared to be particularly appropriate for the research area, IS value and benefit. Significantly, it is a complex system, which is expensive in terms of cost and resources. This key, corporate system was introduced as a strategic implementation with the specific aim of achieving value and benefit. Furthermore, this major system is utilised by users at all levels within the organisation and impacts upon all service delivery functions throughout the Authority. This OA application is, therefore, systemic, which is an important aspect of any organisational-wide case study based approach (Yin, 1994).

## 4.2. Assessment of Office Automation installed at CCBC

The Authority has recently implemented an organisational-wide OA system. This system was introduced to consolidate and integrate the many departmental systems, working environments and business cultures. Prior to the corporate OA implementation, individual users appeared comfortable with existing departmental paper and technology based OA arrangements. However, due to the fact that there was no corporate OA environment, it was difficult to communicate and share information.

There was a general perception throughout the Authority that this situation was both inefficient and ineffective. The corporate OA system was therefore introduced to deliver a coherent business information system on a single information technology platform, across a large geographical area and several organisational sites. This initiative had the key objectives to improve information flow, working arrangements and organisational efficiency.

Development and use of OA at CCBC has been virtually identical to that in most other government and commercial organisations in the past decade. CCBC introduced OA within the past 2-3 years, and so avoided the biggest problem faced by early adopters, that of OA packages highly integrated into proprietary operating systems.

The Authority has seen recent demands for PCs from users, with parallel demands for PC based OA solutions. This trend is matched by organisations in almost every business and Government sector in the UK (Hussain and Hussain, 1997). This reflects what early implementers of OA found. Organisations like ICI and Barclays Bank found it impossible to use just one integrated product. Most organisations ended up with a 2 tier OA strategy based around a WP supplier, such as Wordplex, and an OA supplier, like DEC. Some had a 3 tier strategy with E-Mail and Calendaring facilities on a mainframe using products. In general those organisations have continued to implement multi-tiered OA strategies as they found these to best represent business need and product strengths. These companies are now the leaders in the use of client-server based OA.

The OA product adopted by CCBC was Lotus Smartsuite version 7, which is software that runs over the Authority's Wide Area Network, local Novell networks and PC's running Windows 3.11 or Windows 95. In choosing Lotus Smartsuite, the Authority has one of the most highly rated packages available.

The choice of Smartsuite appears at first sight to have been strategic, since the Corporate Information Technology Client Group (CITCG) - a steering committee of senior representatives from each Directorate and chaired by an user at Assistant Director level - set

up in 1996, had endorsed the choice suggested by the central IT department. There had been therefore, seemingly, a well planned and participative approach to its selection and implementation.

In fact, this OA service was not introduced through a positive commitment to OA by the Authority in its entirety. Significantly, the Director's Management Team and many key users were not consulted. The CITCG had undertaken a review of IT services and simply recommended a number of enhancements, including an OA service. These recommendations had not been based on a formal feasibility study, nor had they been endorsed by the Chief Executive and Director's Management Team.

Put simply, as there was finance available in the IT budget, the investment in the OA service was initiated and the Directors Management Team were merely informed that an OA service was being commissioned. The important issue seemed to be when Directors were to come online to the service, rather than any investment appraisal. Significantly therefore, there had been no formal feasibility study, except for a broad estimate of costs, and Directors Management Team had not underwritten the decision to implement.

Although there were over 1200 licences for Smartsuite purchased, on investigation only a proportion of these, approximately 700, were actually being used. Of these 700 users of OA, the vast majority had only used the WP facilities and Personal Time Management. There was one other main OA facility in use, which was the recent, significant and growing increase in the use of both internal and Internet E-Mail. The majority of potential OA facilities available, as described in Illustration 1, were not being utilised.

Interestingly, no End User Computing (EUC) OA application development had been undertaken within the Authority. This was due in part to the fact that there was no special support service provided through the IT function. OA support was only available through the standard software support services. Support provided by the Authority has reflected the style of implementation. Because it has been facility, rather than business led, all support, other than the original training, has been reactive. This has also had the result of creating a very high ratio of users to support staff. There was very little on-going training, which has affected the level of success of the OA system.

OA had been made available to every staff member who had requested it and there had been no requirement for a business justification to use the system. This was not seen as a problem however, as interviewees were of the opinion that once the OA system and licences had been acquired, there would be no additional costs.

This is clearly not true, as the intangible costs such as IT staff implementation costs, support costs, attaining, increased network traffic and disk storage had been totally ignored. These factors had major impact on the IT departmental resources. Indeed, there had recently been a request for an increase in IT staff as a direct result of the implementation of the OA system. Significantly, there had been no value or benefit appraisal of the effect the implementation of OA.

The implementation of OA at Conwy County Borough Council should, according to the literature, make a significant difference to the organisational efficiency of the local Authority and offer real benefits and advantages. However, the research methodology has highlighted

that there are fundamental OA user requirements that were not provided by the current package. These are documented in Appendix C. This indicates that there has been no requirements specification undertaken and therefore opportunities have been missed to install a system that would satisfy a wider range of users and therefore be of more value to the Authority.

As with many other organisations, CCBC staff see OA not as integrated with their business processes or even integral with other IT but as 'something else' they can use. Adoption of OA facilities has therefore been low with only WP, some spreadsheet work, Time Manager, and E-Mail being seen as valuable. Organisations that have had longer experience of OA have generally moved to implementation by application, or by business process (Ward, 1998). It is clear that linking IS/IT strategy to business strategy is an important factor in the success of OA.

It is apparent from the analysis of the transcripts that OA must fully support current and future service delivery plans. It also emerged that it will be necessary for the OA infrastructure to support any significant changes to the way in which the organisation undertakes its responsibilities in future years. Perhaps most importantly, it has been identified that service plans and OA capability must be considered together. This supports the view, documented in the literature survey, that IS/IT/OA strategy and business strategy must be integrated (Earl, 1996). Only then will OA reflect real need whilst simultaneously shaping service provision. Significantly, in this case there has been no alignment of IS (OA) strategy to business strategy.

The case study established a perspective on the social and organisational culture of CCBC. Many of the social aspects of IS had not been addressed which had led to user frustration. The IT training element of the project was inadequately identified, planned and delivered. Moreover, it was recognised that inadequate training had in some instances led to only very limited success, which had subsequently resulted in a poor return on investment. Users had cited anecdotal examples of systems and procedures being virtually paper-based one day and computer-based the next. They further maintained that generally, they had not received adequate and timely training in the use of the new system. Managers stated that they had not got the anticipated benefits from the introduction of OA.

The IT help desk manager described the frustration of having received many low level, rudimentary calls for assistance from users. These calls had a significant impact upon the IT help desk resources and were avoidable, in his view, if adequate IT training had been undertaken. Significantly, much of the social aspect of IS has been overlooked and consequently users have not been consulted and have not received adequate training.

Implementation monitoring and evaluation processes are non-existent. There has been no evaluation of the value and benefit of the OA service through a post implementation review process. Consequently, no difficulties were formally documented and no subsequent refinement of the OA service was identified or undertaken. Regular reports were not compiled or presented to management team. The implementation and operation of the OA system was not continually monitored and evaluated in terms of broad costs and accrued benefits. Various reasons for not undertaking a post implementation review were offered by interviewees,

including it is not necessary, it is too difficult and it is too costly. One honest interviewee admitted that the main reason was the *potential consequences* if the results were poor.

Despite the OA implementation being partly a disappointment, the overall perception by interviewees is that OA was well implemented and well supported by IT staff, even though there was no specialist central IT End User Computing Team. In addition, the service was used by a large number of users, albeit somewhat under-utilised. There were also many positive aspects about OA, including the growing support services and a clear demand for OA from knowledgeable, assertive and well informed users.

The key issues that have emerged during the case study, which have influenced the OA implementations are:

1. Feasibility Study and Senior Management Team Commitment
2 Value and Benefit Appraisal
3. IS Strategy aligned to Business Strategy
4. Social Perspective
5. Post Implementation Review and Evaluation

This concludes the case study. The key theme analysis is discussed in the next section.

## 4.3. Analysis

This section analyses and discusses the issues and implications identified during the case study using the key emergent themes. Where appropriate, tools and techniques identified and selected during the literature survey have been used to assist with the analysis.

The importance of a formal feasibility study, which is underwritten by Senior Management is the first key emergent theme and this is discussed in section 4.3.1. The importance given to IS/IT investment and its link with business value and benefit to the organisation is the second key theme. Analysis of this issue is discussed in section 4.3.2. The impact and influence of an organisation's prevailing IS strategy and the importance of aligning IS strategy to business strategy has been highlighted as the third key theme. Generic IS Strategies are used to assist with this analysis, which is discussed in section 4.3.3. The prevailing organisational culture and approach to IS implementation has been highlighted as the fourth key emergent theme. This is examined with regard to a holistic, participative and social approach to IS implementation. This analysis, from the social perspective, is undertaken in section 4.3.4. The advantages of undertaking a review and evaluation of the OA service through a formal post implementation review process is discussed in section 4.3.5. Finally, a summary of the key theme analysis contains findings, a description of the current position and future proposals to obtain greater value, ensure greater benefit and increase the successful operation of OA within the Authority is discussed in section 4.3.6.

### 4.3.1. Feasibility Study and Senior Management Commitment

The procurement (or development) and implementation of a large information system is one of the most complex and costly tasks undertaken by an organisation (Galliers and Baker, 1997). Projects which exceed their projected development costs and timescales are common (Avison and Fitzgerald, 1990). In addition many systems, when implemented, do not provide all the facilities the end user required and consequently, end users are often dissatisfied with the final system (Sauer, 1993; Hussain and Hussain, 1997).

Before any decision is contemplated regarding the procurement or development of an information system therefore, it is wise to invest resources in deciding whether the proposed system can deliver what it promises and can be achieved within given constraints.

Hussain and Hussain (1997) contend that there are four main perspectives on a feasibility study. These are defined as economic, financial, technological and organisational. They suggest that each is the speciality of a different group of people. Thus the economic feasibility should be undertaken by the strategic planning department, the financial feasibility should be undertaken by the finance department, the technical feasibility should be undertaken by the IS/IT department, perhaps assisted by expert consultants in the field, the organisation study should be undertaken by management, perhaps corporate management in consultation with IS management. A report should be prepared, which is then submitted to the Chief Executive and senior management to enable them fully understand and commit to the proposal.

However, at CCBC, the CITCG, a steering group consisting of senior representatives from each department, had undertaken a informal review of IT services and simply recommended a number of enhancements, including an OA service. These recommendations had not been based on a formal feasibility study, nor had they been endorsed by the Chief Executive and Director's Management Team. Senior Management within the organisation should consider whether this approach is appropriate. Many individuals on the group had vested interest in the implementation of the system. For example, one interviewee confided that he wanted to have access to the Internet from his desk and realised that OA could provide this service. Interestingly, he also stated that he had no real business need for Internet access.

Clearly, the first activity in any IS development must be a properly conducted feasibility study. It needs to consider the many factors relating to the implementation of an information system. Any information system is resource-consuming, and the feasibility study should address:

- opportunities
- contribution to organisational goals
- task appropriateness
- inherent risks
- time factors
- technical issues
- political factors
- social factors
- environmental factors

This study must also have a project sponsor at the right status within the organisation. It is accepted that the study may have a rational and scientific perspective, but should also be shaped by political and subjective decisions. The top priority therefore, is that any feasibility study must be fully understood, and fully committed to, by top management. Unfortunately, the culture to support this had never been created at CCBC.

There are however, potential problems with feasibility studies:

- difficulties obtaining objectivity from interested parties
- resistance to IS/IT
- unrealistic expectation of end-users
- conflicts between stakeholders
- lack of skills to properly write a feasibility study
- gaining commitment of top / senior management

I would like to offer another option, which may be worthy of consideration. This is the notion of an organisation having a benefits management approach to complement their systems development, project management and implementation functions. This situation does prevail in certain organisations.

This would require the appointment of a specialist business project manager, with the necessary skills to undertake rigourous feasibility studies. This role would best not be situated in any functional department, but perhaps being independent, reporting directly to the Chief Executive of the organisation.

The role of the business project manager would be to improve the business relevance and delivery of systems. Amongst the key responsibilities would be feasibility studies and the identification and delivery of the costs, value and benefits. The duties may even include post implementation reviews. This role would be independent and objective, and would enable the Chief Executive to have a foot in the camp. Perhaps this is an area where further research is necessary.

### 4.3.2. Value and Benefit Appraisal

There is a growing awareness that the implementation of new technology forms an integral part of the provision of organisational services and therefore is a key and vital resource. However, any investment in new technology should be examined for its business value and benefit to the organisation (Ward, 1998). One phrase sums up a primary concern of many Chief Executives - 'Getting value for money from IT' (Price Waterhouse Review, 1996). In the case study, the undertaking of any cost benefit appraisal or business value exercise was conspicuous by its absence.

It is clear, therefore, that the Authority implemented an OA strategy without any consideration towards cost or value to the organisation, but rather by the influence of 'technology push and market pull' by IT Management and software suppliers because it was the 'fashion' to do so. OA was not linked clearly to any business strategy.

Ward's (1998) model of Cost Benefit Appraisal (CBA) contends that the only way in which CBA can be at all meaningful is where one of the following methods of benefit identification can be made:

- Staff numbers can be reduced whilst still providing the same quality of service.
- The same number of staff can accommodate quantifiably more work.
- Overhead costs in running a service can be reduced.
- There is intrinsic benefit to the public in providing a service that meets the Service Delivery Plan.
- Improved utilisation of resources.
- Improved quality of decisions.

There should be no confusion over 'soft' or 'hard' benefits. Hard benefits merely indicate that the benefit is measured in a purely quantitative and financial way. Soft benefits refer to qualitative and non-financial benefits. These should both reflect the goals and targets contained in the business strategy or service delivery plan.

CBA should always be used to confirm that there is a real need for each OA application. Senior Management at CCBC, who were ultimately responsible for the organisational expenditure had tacitly sanctioned the introduction of OA, but then were reluctant to use it because they perceived that there was little or no benefit. Where this view came from, and why they incurred expenditure on OA in the first place - if it was felt there was no value to OA - were questions to which the interviewer was unable to obtain answers. Here is a classic IS/IT

investment situation, as Ward (1998) suggests, where there was no management process in place to govern the achievement of the desired outcome and no process to evaluate what benefits were actually achieved.

Using commercial implementations of OA during the past 5 years as a guideline, it has been the case that the full investment in OA takes some 2-3 years to be 're-paid'. Significantly, it only gets repaid at all if there is a program of application development. If implementation of OA is left to users alone, then the investment is never recouped (Popel, 1997). As no development, not even limited, had taken place, it suggests that the other Authority would not achieve value for money.

The average cost of implementation over a four year period has been estimated as between £2,500-£3,000 per user (Price Waterhouse Review, 1996). This figure has barely changed in the past decade and reflects the growth in OA services to support users to compensate for the drop in hardware prices. Package costs have remained virtually stable. Consequently, using this formula, the cost to CCBC is 1200 (total Smartsuite licences) x £2,500 - £3,000 which is between £3m and £3.6m. This cost could have been reduced had only actual user licences had been purchased. This would be 700 (actual Smartsuite users) x £2,500 - £3,000 which is between £1.75m and £2.1m. A significant saving.

Although it is difficult to obtain exact costs for implementation of any of OA, it is important that some attempt, however crude, is undertaken. At the simplest level, costs can be obtained based upon aspects such as the topography of the network, number of processors and number of users, in a fairly broad brush manner. This approach is not difficult, and could even have

been determined by third parties, thus saving valuable central IT staff time, by preparing and circulating a 'Request for Information' from the recommended potential suppliers.

Once this information is available and guidance on cost apportionment is given, then a cost breakdown can be created. There should be different phasing for these costs; e.g. acquisition, implementation, initial demonstrator, migration, creating a consistent environment and ongoing development.

One of the keys to the IS CBA, benefit evaluation and management process is the way in which organisations fulfil the information management function. This function is unique and is frequently not well managed (Ward, 1996). This is because in many organisations, CCBC included, the measuring and management of IS benefits is regarded as being in the domain of the information systems department (ISD)

Information management is often perceived as highly technical and therefore in the domain of technical personnel. This is a view that has been encouraged by IT professionals. It is often assumed by top management that the ISD engages in the usual processes of planning, organising, motivating and controlling. However, the management of the ISD is often neglected.

The key issue is that of responsibility. The introduction of a new system always results in change to processes in the organisation. Although the ISD is responsible for the procurement of the OA system, they should not be solely responsible for justification or benefit evaluation.

An exercise to establish the value and benefit of OA to a particular organisation may not affect the overall outcome of the system in terms of functionality or acceptability. However, it is necessary to demonstrate value for, and give credibility to the introduction of OA.

The critical discovery is that no cost, value, or even expected outcome exercise was undertaken by the Authority as part of the OA project. Neither had responsibility for this function been designated. The organisation should question whether this approach is acceptable.

### 4.3.3. Information Systems Strategy Aligned to Business Strategy

The application portfolio approach proposed by McFarlan and McKenney (1992), is a dynamic and qualitative method and classification framework for strategic analysis which helps determine whether the best use is being made of current IS/IT applications. Based on the product life cycle and the Boston Consulting Group Matrix, it is a predictive tool which provides a snapshot and assessment of the current situation. This, in turn provides pointers to the desired portfolio and helps develop strategy. Generic Strategies, proposed by Parsons (1990) can then be mapped onto the portfolio to improve the finer picture.

These strategies are defined as:

1. Centrally Planned IS totally integrated and interdependent with corporate strategy

| | | |
|---|---|---|
| 2. | Leading Edge | Assumption that IS will create competitive advantage |
| 3. | Free Market | The User and/or Manager knows what is best for business |
| 4. | Monopoly | IS is a sole source utility |
| 5. | Scare Resource | Budget set in advance, competition for a share of the resource |
| 6. | Necessary Evil | IS used only to meet legal requirements and for a very high return on investment |

On examining the above model, it can be seen how the generic strategy of CCBC has influenced the prevailing OA Culture within the organisation. The prevailing strategy was one of Centrally Planned, where the OA was planned by a steering group, the CITCG, and introduced to some degree, as corporate strategy. This strategy enables large investments and optimum deployment of resources.

However, formal support services were limited which had restricted the growth of OA and although there were some success stories, OA would have been more successful had there been better support, perhaps in the form of a dedicated IC team within central IT. It is clear that the Generic Strategy exerted an high level of influence on the successful implementation of OA. The case study has highlighted that an appropriate Strategy - i.e. Centrally Planned - should be adopted so help ensure maximum value is obtained for IS investment.

The application portfolio and generic strategies are one of many techniques to obtain a situation audit and help understand the overall position. This approach should not be used in

isolation. Other methods and models for assessing strategic use of IS/IT should also be used to support the conclusions and develop the notion of triangulation.

From research (Earl, 1996) there appear to be three workable approaches to IS strategy planning. The first is that no IS strategic planning is done at all. Instead, normal business planning processes are expected to include an analysis of IS opportunities and consideration of the IS implications of business plans. For example, a few themes fall out of the annual business or service delivery plan which deserve or depend on IS investment.

The second approach is that no IS strategic planning is done because long range planning of any sort is counter-cultural. This is particularly true in the sponsoring organisation and the public sector in general. Earl (1996) contends that the organisation stumbles on IS need by accident. However, there is an element of design in that management meetings and deliberations include discussions about the relationship of IS to other matters being examined.

The third approach is that of the use of task groups and steering committees to identify businesss opportunities or address problem areas. These groups are made up of staff from a variety of backgrounds. Business themes and problem solutions are developed with the emphasis on analysis current business opportunities, problems and environmental change. Significantly, these groups consider IS as one ingredient of the solution, not the whole solution. Business themes for IS must be found rather that formulating IS strategies for the business.

However, the need to integrate IS with the business is not a new message. Recent research work by many, including Morton (1995) and Hammer (1997), indicate that technology, strategy, organisational structure, individuals and their roles, corporate culture and management processes need to be developed and integrated as whole. IS should not be treated in isolation, or above the business. IS must be grounded in the dynamics of organisational strategy.

To conclude this section, the author would submit that common and business sense must not be eroded by the enthusiasm of the IT industry, the specialist knowledge based power of the IS function and the tacit presumption of general and senior management.

### 4.3.4. Social Perspective

The literature survey highlighted that information systems have traditionally been conceived as a means of managerial and social control, because they possess the power to direct, command and restrain (Briefs et al 1993). However, it is increasingly becoming recognised that IS/IT is now first and foremost an enabling technology. This is particularly true of OA. The IS/IT industry has many examples of systems which were introduced, only to find that anticipated benefits were not realised because the social elements were not fully considered (Sauer, 1993). The implementation of IS therefore, should be considered in conjunction with the appropriate social culture, present within an organisation to support the business objectives.

The case study established a perspective on the organisational culture of CCBC. This was to be expected. However, the interviews called into question a number of underlying assumptions held by others. For example, very few interviewees considered whether the perceived goals of the organisation were in common with other departments and other individual employees. Goals were not often shared, indeed, many goals were in conflict with one another. For example, the Finance Department were seeking to keep expenditure down whereas the Social Services Department wanted to increase expenditure, to deliver better quality services. This is a reflection of the difficulty in evolving a single corporate culture within a Local Authority, which can be viewed as many separate 'businesses', rather than an organisation that has a single, well communicated purpose.

Another emerging social aspect was the notion of conflict. Many people ascribe to a cooperative or conflict-free view of an organisation. That is, a relatively stable environment, embracing an objective and rational co-operation among members. However, this view did not prevail in the Authority. Instead, conflict was occurring. The organisation was effectively a bargaining system, where individuals and departments negotiated and bargained with each other for power, resources and information.

To achieve successful implementation of a system that will be utilised by the whole office workforce, an all embracing and co-operative organisational culture must prevail. Only then can OA be fully embraced by the workforce to promote and support emancipation and help achieve organisational objectives. This observation supports the view of Lehtinen and Lyytinen (1995). This culture is commonplace in Scandinavia and it has been proposed that

this has greatly contributed to successful Scandinavian IS/IT implementation (Kling, 1994). This is an area perhaps, where further research is needed.

The social view of the office must also question the concept which suggests that people merely work to earn a living. While this may indeed be true, a person also works to keep the mind active, achieve self satisfaction and to experience interaction with others. Work satisfies the needs for freedom, recognition, value and meaning. The case study highlighted that there is a growing trend for people to want more autonomous work environments and participate in the decision making process. The successful implementation of OA can contribute toward achieving this phenomenon.

Mumford and Weir (1983) suggest that a participative, socio-technical approach should be used to help achieve successful IS/IT. This is defined as 'a philosophy that produces productivity, quality, co-ordination and control, which also provides a work environment and structure which people can achieve personal satisfaction'. Although primarily directed at IS/IT systems development, this approach is equally valid for the selection and implementation of an OA system.

Implementing OA through a participative philosophy, involving all levels of employee who will ultimately operate and use the system, has much to offer. It would act as a catalyst and get various users thinking about new social arrangements. Any new technology has a better chance of success if its users understand it and feel responsible for its introduction. However, managerial ideology and values are often at odds with participative philosophy. Unfortunately,

this was the case at CCBC, which had an autocratic culture to a certain degree, which contributed to the limited success of OA.

Another social aspect, the maturity of the End User Computing (EUC) community, emerged as an important factor in the case study. EUC has been defined as "The direct, hands-on use of computers by end-users. It is not the traditional use of systems developed by computer professionals" (Robson, 1997). As previously established in the literature survey, OA is one important aspect of EUC (Meyer, 1996).

Categorising EUC maturity, identifies its position in the respective organisation, reflects the IS/IT maturity of an organisation and ultimately helps organisations manage the EUC function. Categorising EUC maturity by the level of End User autonomy has been proposed in a 4-stage model (Robson, 1997):

| | | |
|---|---|---|
| 1. | No Autonomy | IS/IT function has total responsibility for, and control of, all aspects of the system |
| 2. | EU input but not control | Users specify requirement for system but IS/IT function responsible for selection, implementation and maintenance |
| 3. | EU selection and operation | Users specify and select system, IS/IT function responsible for implementation and maintenance |

| | | |
|---|---|---|
| 4. | EU development | Users specify, select system, and are responsible for implementation and maintenance |

At all levels in the above model, some degree of EUC can be seen. However, only at stages 3 and 4 is EUC integrated with the organisation. At CCBC, a well developed and mature EUC and OA culture prevailed, in that End Users, in the form of the CITCG, helped specify, select and implement OA.

Interestingly, OA was well supported informally by IT staff, even though there was no central End User Computing or Information Centre team, which is traditionally the case where there is a mature OA culture (Robson, 1997). The fact that there had been very little provision of formal internal support and training of OA users by IT specialists compared with commercial organisations, almost certainly restricted the OA success stories within CCBC, that might otherwise have been found in greater numbers. This certainly contributed to the full value and benefit potential of OA not being realised.

The final important social aspect that emerged from the case study is the provision of timely and appropriate training. This training element is crucial in minimising the potentially serious consequences of a failed or ineffective information system (Boydell and Leary, 1996).

A major complaint of many end-users was that they have had little or no IS/IT training. Users who have received training, often perceived it as ineffective and management complained that often, they do not get the anticipated performance and administrative improvements promised

when the new technology was introduced. Adequate and timely training had not been provided by the Authority and consequently this had resulted in :

1. Under utilisation of OA
2. Failure to maximise the OA investment
3. Excessive costs - for example, superfluous training
4. Insufficient staff skills to carry out the work of the department
5. Reliance on informal and personal documentation
6. Low end-user morale
7. Dissatisfied Managers and perception that OA delivers less than envisaged
8. Additional call on existing resources - for example, unnecessary calls for assistance to the internal IT help desk

The Authority therefore should establish, and be committed to, corporate IS/IT training to underpin IS investment. There should be a clear set of objectives and a defined policy for IT training. The IT training element of any IT project should be clearly identified and planned to ensure IS/IT systems are successfully implemented. IT training should be regarded as an essential investment for the future rather than a token gesture or a drain on budgets.

IT training should be provided for the benefit of both the Authority and the individual member of staff. Appropriate, adequate and timely training should be provided for all staff who use, develop, operate or support an IT system. IT training should be regarded as an ongoing process. Adequate documentation and support must be available to IT system users.

Any IT procurement process should include the training implications for individuals involved with the proposed system. Any upgrades or enhancements to systems should also include training elements.

Identified training costs should be included in the cost benefit analysis for any IT system procurement. Overall costs should be considered when undertaking a training programme. These include the cost of the training itself, travelling and subsistence, the consequences of staff being away from the office.

The case study highlights that the application of office technology is less of a technical innovation than a social one. The analysis in this section concurs with the view of Lyytinen, Klein and Hirschheim (1996), that the implementation of new technology is crucial and that social consequences should be considered and minimised. OA implementation, therefore, should ensure that the new technology meets user requirements and gain user acceptance. This is a fact which history has shown is neither easily achieved or well understood.

### 4.3.5. Post Implementation Review and Evaluation

A post implementation monitoring review and evaluation process is an important factor with any new initiative and should form part of the overall project plan of any IS implementation (Clare and Stuteley, 1995). This will enable problems and issues to be formally documented, regular reports presented to management team and remedial action taken where necessary. Unfortunately, this phase of OA implementation had not been undertaken at CCBC.

Although it was recognised that there was a need for a review and evaluation process, the dilemma was who was to undertake the review. As discussed in section 4.3.2., the key issue is responsibility. Although the ISD is responsible for the procurement of the OA system, it should not be solely responsible for justification or benefit evaluation.

The CITCG, operational management, users and the directors management team all have their own concerns and pressures. None has a suitable detached opinion and objective attitude to undertake benefit analysis alone. Yet input is required from each group. A team approach would seem most suitable, combining the best from each group. The staff selected to sit on this team need to have between them a wide experience of the operation area affected by the system, a detailed knowledge of the new system and a good background in the management of change or IS implementations. The main benefit of this approach is that the group would consist of senior, experienced and trusted managers acting as honest brokers. The objective is an impartial analysis showing benefits of the system, leading to sensible claims for enhancement or initiatives.

An important additional benefit of the group approach is the maximising of value and benefit from the system by ensuring the organisation knows what is going right and wrong, and knowing which groups are gaining maximum and minimum benefit from the OA implementation. Assistance, where necessary, can then be directed to the right place.

The organisation may alternatively adopt the idea of the dedicated business project manager, as previously discussed in section 4.3.1. One key area of responsibility should this role be

formally adopted, would be to conduct and co-ordinate the post implementation review to assess delivery of the costs, value and benefits of the project.

Whatever approach is adopted, evaluation procedures should be compiled and administered to ensure maximum benefit is being derived from OA. This should include performance measures.

Implementation of any initiative is not static (Clare & Stuteley, 1995). This is particularly true in the field of IS where developments occur rapidly. The OA service must be constantly monitored, reviewed, updated and adjusted as emergent and future strategies appear and as the business environment, culture and climate change. Successful strategies and strategy implementation is key to the success of organisations and if applied correctly, can help achieve real advantages.

### 4.3.6. Summary of Key Theme Analysis

This section describes the current OA position and proposes a way forward for the Authority with regard to OA.

Although the culture and usage of OA has been on a par with many commercial and some public sector bodies, the overall picture of OA implementation and the overall development of OA within the Authority is somewhat mixed. However, this should not be seen as problematic

as this situation can be exploited, with minimum cost, to obtain improved value and benefit from current IS investment.

The Authority can dispense with the previously low-key approach to OA evolution. The current stage of 'consolidation within a multi-tiered corporate service.....' is a framework that will remain for the remainder of this decade, and probably beyond, as there are many technical reasons for expecting OA to be in a period of relative technical stability.

There will still be an evolution of different software products, but these will become building blocks within an overall portfolio, and relatively easily changed as required. CCBC should develop plans via a holistic approach, which has full senior management commitment, to migrate to this culture.

The greatest challenge facing CCBC will not be encouraging the use of IS or OA, or to introduce the best software solutions, but to ensure that an appropriate strategy is followed with an internal support programme to manage the anticipated explosion in demand for IS facilities, and help educate staff in using these to support the provision of the Service Delivery Plans. Most importantly, these factors require planning, managing and monitoring to ensure the best use, value and benefit is obtained from the investment in the technology to help ensure efficient, effective and successful IS.

In summary, the position is one of optimism as there is great potential to exploit existing OA provision and move forward to the next stage in the development of an integrated OA service at CCBC, which is outside the scope of this dissertation. Key staff recognise that successful

implementation of OA, aligned to business strategy, will offer the most direct method to manage many aspects of Conwy County Borough Council.

The following chapter discusses the lessons learnt during this project and proposes a good practice framework for the future appraisal of IS investment and in particular, OA, implementation.

# Chapter 5

## Lessons Learnt and IS / OA Strategy Framework

This chapter is reflective in that it discusses the findings of the research dissertation. As a result, it documents good practice to help ensure that maximum value and benefit is obtained from future IS/OA investment.

The development and use of OA within CCBC has been moderate. The success of an OA does not merely depend upon the selection of the right products, but is concerned with other factors, few of which are to do with technology. The correct combination of package choice with the application of success criteria will be a powerful alliance. This conclusion concurs with the view of Wisemann (1995). The success criteria that have been identified from the case study to form a proposal for best practice are as follows:

1. A properly conducted feasibility study should be undertaken which identifies cost, value and benefit from the implementation of new technology.

2. Commitment is needed from top management.

3. A cost or value exercise is essential because OA should be seen to deliver value.

4. An ongoing OA strategy should be developed which is integrated with the overall IS/IT strategy, which in turn is integrated with business strategy.

5. A centrally planned generic OA strategy would be most beneficial and can best be undertaken using the participative, holistic approach. All staff, including senior management, need to participate in the selection process and have ownership of the chosen product.

6. OA should be recognised as an integrated and collaborative business service, implemented to support the Service Delivery Plans and just not orientated for members of staff to undertake individual tasks.

7. OA support resources with an adequate R&D budget should be made available to support the use of OA.

8. Formal OA education, support and training of OA users should be continuously undertaken, which is orientated both to the OA application and to its use within a business context.

9. A post implementation monitoring, review and evaluation process should be introduced to ensure that implementations are successful and/or identify problem areas to enable remedial action to be taken.

This concludes the good practice framework. A process of reflective evaluation was undertaken by the author as part of the project and this is discussed in the next chapter.

# Chapter 6

# Conclusion

To be more effective in measuring and managing IS value and benefit the organisation should review its attitudes towards IS investment. It would appear that what is required is a strategic appreciation of the value of IT, together with a detailed understanding of the resultant cost base. IS investment should not be seen as being materially different to any other investment. Decisions about IS share many characteristics with core business decisions and often involve high risks, large sums of capital expenditure and high revenue streams. It has emerged from the case study that top management appear to have ignored IT investment decisions by delegating them to specialist IS management, functional management or user groups. In an era when organisations are critically affected by the successful use of IS and when large costs are involved, top management should consider whether this approach is appropriate.

The case study highlighted that there is no doubt that better use could have been made of OA, had there been a will by management to do so. The organisation does not appear to give sufficient senior management attention to the use of IS. This is especially important for strategic and corporate applications. Furthermore, it would appear that IS management are not fully educated with regard to core business and service delivery issues. As a result, senior managers do not understand the issues inherent in IS investment appraisals and IS staff feel unable, or unwilling, to offer sufficient commitment towards achieving benefit in core business, and unable to identify real business value in IS investment. Consequently, there seems to be a lack of clarity as to who has the responsibility of demonstrating and achieving Value and Benefit from IS investment.

It would appear to be very difficult to effectively employ and measure IT in an organisation unless there is a systematic approach to both IT investment justification and post implementation audits. However, the case study demonstrates that there are inherent difficulties associated with quantifying estimates and the subsequent analysis, which are compounded by the fact that there no one single metric.

To measure and manage IS value and benefits professionally is obviously a complex, multi-faceted and therefore difficult task. It is a subject which perhaps traditionally has not been given significant attention, but which, with growing concern to improve corporate efficiency and effectiveness, will continue to attract a growing level of interest and where further research is necessary.

# Chapter 7

# Critical Evaluation

This chapter discusses a critical evaluation of the project and a critical self-evaluation in terms of learning.

The research dissertation adhered well to the initial project proposal and has met its stated objectives as defined in the project specification, viz:

1. Performed a literature survey to establish an academic perspective on Office Automation and IS Investment and Value.

2. Described in detail the design and implementation of a case study and identified issues associated with this specific situation.

3. Analysed and evaluated the key issues from the case study.

4. Formulated a proposed good practice framework for defining and measuring IS Investment and Value for the Local Authority.

5. Undertaken a Critical Evaluation of both the dissertation and self.

A great deal of hard work was involved and the interviewing, although enjoyable and enlightening, was time consuming. A large number of staff were interviewed as listed in figure

two in chapter 3. This was intentional, as it enabled a broad view to emerge, which may otherwise have been too narrow. However, with hindsight, the number was excessive and a little ambitious. It may have been prudent to limit the number of staff interviewed to a maximum of two key people per department.

On occasions, there was a temptation for interviewees to go off at a tangent and introduce unrelated issues. I had to ensure that the interviews were kept focused on the subject in question. As the interviews progressed, I gained further experience in assertiveness which facilitated firmer control over the direction of the interviews. This was a valuable acquisition which would certainly be employed should a similar task be undertaken again.

Interestingly, I had an implicit assumption prior to the case study interviews that users were comfortable with existing arrangements and were maximising potential benefits from the OA service. This turned out not to be the case. Users could see many of the shortcomings of the OA implementation and were receptive to the idea of a better consultation, OA training, utilisation and post implementation review and evaluation.

In attempting to develop a qualitative and intuitive research methodology based on grounded theory, the project was approached with an open mind and an objective view was sought. However, my own preconceptions, derived from the literature survey and own knowledge, experience and background may have influenced the findings.

The research methodology used does have problems and has been subject to criticisms. Clearly, data validity is a problem with this type of technique, because of the interpretative nature of the data (Baskerville and Wood-Harper, 1996; Nandhakumar and Jones, 1997). However, similar to a methodology such as Action Research, I feel that my study enabled research themes to emerge, that could be used to allow future work to be undertaken to confirm or refute my findings. In addition, a practical outcome, in the form of a good practice framework, was achieved which could assume a future role in IS practice.

I have discovered that independent research and 'learning by doing' focuses the mind and demonstrates how theory becomes relevant. In addition, the research dissertation highlighted how several distinct subject areas can come together to form cohesive thoughts.

Finally, this task was an enjoyable research and learning experience, which has enabled the skills and knowledge gained through the MSc Information Systems course to be utilised. The results of this project will be presented to the sponsoring organisation for consideration. It is the intention that the findings will form the basis of action, which will generate direct and real benefits to the organisation in the future.

## Glossary

| | |
|---|---|
| CBA | Cost Benefit Analysis |
| CCBC | Conwy County Borough Council |
| CITCG | Corporate Information Technology Client Group |
| DEC | Digital Electric Computers |
| DP | Data Processing |
| EUC | End User Computing |
| GUI | Graphical User Interface |
| IBM | International Business Machines |
| IC | Information Centre |
| ICI | Industrial Chemicals Limited |
| ICL | International Computers Limited |
| ISD | Information Systems Department |
| IS/IT | Information Systems/Information Technology |
| LAN | Local Area Network |
| OA | Office Automation |
| PC | Personal Computer |
| R&D | Research and Development |
| WP | Word Processing |

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## Appendix A: Plan of Research

The plan of research followed the stages and timetable as documented below:

| | | |
|---|---|---|
| 1. | Consider Possible Dissertation Subjects | September 1997 |
| 2. | Submit Dissertation Proposal | October 1997 |
| 3. | Meet Project Sponsor & Agree Dissertation | November 1997 |
| 4. | Undertake Literature Survey | January 1998 |
| 5. | Design Study | March 1998 |
| 6. | Undertake Case Study | May 1998 |
| 7. | Analysis | July 1998 |
| 8. | Write up Thesis | September 1998 |
| 9. | Submit Dissertation | November 1998 |

## Appendix B: Office Automation Definition

This Appendix is designed to act as a pointer to the scope of OA, without being exhaustive.

Elements of OA can be defined as:

Administrative Support

Electronic Mail

Electronic Filing

Bulletin Board

Shared Databases

Workgroup Development

Workflow Automation

Process Automation

## Administrative Support

This is the provision of the range of facilities that are often associated with Personal Computing. They include:

- Word Processing
- Spreadsheet
- Presentation graphics

- Personal Information Management (including diary management)
- Personal database

## Electronic Mail

Electronic Mail will provide facilities to transmit and receive any type of document that can be stored on a computer. This means that reports, maps, diagrams, voice or video clips can be transmitted as simply as text. Facilities exist to have these other application areas 'mail enabled'. This means that someone working on a map could 'send' it to someone else from that mapping application, without having to exit the application and load up the E-Mail package. Related to E-Mail is a term called Directory Services. This is a way of allowing anyone to send E-Mail to anywhere else in the world. The Directory Services provide unique addresses in the same way that each of us has a unique postal address for our house. E-Mail can link to, or co-exist with, Voicemail to allow text messages to be 'read' out to a user on Voicemail who has access to a telephone.

## Electronic Filing

Electronic files can be used in three main ways. Firstly, information can be held which may need to be infrequently accessed by a large number of people, in a similar way to a public library. An example of this might be that all Personnel regulations were available on-line, so

that a manager could refer to disciplinary codes, without reference to a Personnel Officer. The information would be held once and would be immediate, accurate and always available. Secondly, there are documents that may need to be set up as corporate standards, e.g. the Terms of Business for the new Authority. These could be accessed and included in other new documentation to ensure that this type of detail was not unnecessarily re-created every time it was needed by a different department.

Thirdly, archives of historical documents can be retained. Examples include Council Minutes and all Planning Applications approved.

## Bulletin Board

Bulletin boards are non-intelligent repositories of information which are created and maintained by their originators. They can, however, be accessed by anyone who has the permission of the originator. An example might be a board that provides a daily news report of all issues being dealt with by the publicity department.

## Shared Databases

A shared database is similar to a bulletin board, but with one major difference. It allows anyone with access to the database to contribute to it. There are several potential uses for shared databases. For example, problem solving. An example could be that someone in one

department would like assistance with a Service Level Agreement (SLA), but does not know who can help. This person would set up an open shared database. Anyone can contribute to this and once someone from another department has seen the request and helped the originator, then the originator can close the database, as there is no longer a need for it. In this way one person has raised a problem, and been helped by someone who possibly has never met the originator and perhaps did not even know they existed.

A second use is like that given in the main body of the report for holding all contributions from a closed group, such as any IT Working Group. There would be a constantly changing number of databases, often of quite short life each. Lotus Notes is an example of a product that supports this type of OA application area.

## Workgroup Development

OA should be seen as the means to develop small departmental applications. An example could be to plan visits to all major local architects as part of the pro-active work of the Planning Department. This might require access to other application software and would be seen as supportive of the main application package to an individual department.

These applications will probably use a mixture of text, data, image and graphics now, and voice and video in the future (for example to film a site for assistance with a Building Control application). Consequently, this is both beyond the scope of a simple PC solution, as it will provide information to a number of people, and is equally unlikely to be developed by the main

IT department resource, as their development tools will generally not be capable of handling multi-media.

## Workflow Automation

Software can be invoked that is linked to an automated process that is generally built around the processing of files or documents, where the stages are well defined.
For example a form could be designed that was to provide authorisation for the purchase of a PC. The person wanting this would fill in the details of what they wanted and why it would be beneficial to them. The application itself might then send this automatically to the IT department who would check that it meets the PC procurement policy. The document would then be marked as OK and automatically 'passed' electronically to Finance to see if this was covered in the budget.

In this way a complete process can be automated and this ensures that all steps are not only carried out, but in the correct sequence. Rules can also be added so that if condition 'A' applies then the routing is different than if condition 'B' applies. It is now normal for these products to be highly integrated with Imaging systems so that external correspondence, for example, can be stored as part of an application solution.

## Process Automation

Despite its name, Process Automation has little in common with the automation of processes covered by Workflow tools. Process Automation is a way of capturing fixed business procedures within a department, such as how work is scheduled to complete all Building Control applications within 5 weeks. It 'captures' all stages in a process and checks how long each stage takes. There are also facilities to simulate a workload. In this way it can identify bottlenecks and indicate the effect of changing procedures, or recruiting an additional member of staff for particular tasks. This type of software is in its infancy, but will become usable within 6-12 months.

## Appendix C: Office Automation Requirements

User Office Automation requirements emerged during the case study, via the research methodology, by interviewing CCBC staff. This was not anticipated, but it is worth documenting, as it would appear that these fundamental requirements were not identified prior to the implementation OA at CCBC.

It is clear from the transcripts that OA must fully support current and future service delivery plans. It also emerged that it will be necessary for the OA infrastructure to support any significant changes to the way in which the organisation undertakes its responsibilities in future years. Perhaps most importantly, it has been identified that service plans for the future and OA capability must be considered together.

### Facilities for Elected Members

There are a small number of elected members of Conwy CBC who currently have a PC at home, and several who are considering purchasing one, possibly with financial assistance from the Authority. A small number of these were contacted during the project to ascertain their needs for the future provision of services to them.

In addition there are plans to provide a small number of PCs for members to access applications such as a Committee Minutes system. Finally, members may want to have access

to information, filtered for their use, from any of the PCs in general use within the Authority, on permission from the appropriate officer.

## Facilities for Staff

The information in this section was taken from comments made by individual members of staff interviewed. In many cases this was not expressed as a specific need in technological terms, but as a need to undertake their job in a particular way. The list of services required include:

Word processing

Spreadsheet

E-Mail

File transfer facilities

External service access

Free text retrieval

Meeting organiser

Calendaring

Shared databases

Bulletin boards

Document management and production

Document publishing and review

Project management

Image systems

Corporate database development

Internet gateway

Personal information management (PIM)

Enquiry tools

Departmental application development

Printing services

Integration of E-Mail and Voicemail

## The Future

Future needs of individuals and the organisation were identified during the interviews. It is clear that these should be supported. Any choice of OA product therefore, must be future proof. Those identified during the case study include:

Personal conferencing

Full remote meetings

Desktop conferencing

Computer Supported Co-operative Work

Of the four requirements listed, it is the ability to share information across video links, that is likely to be the service most needed by the new Authority. This was expressed as an important and key need by many of the interviewees.

## Appendix D: Office Automation Suppliers Consulted

International Business Machines

International Computers Limited

Lotus Corporation

Microsoft

Novell

## Appendix E: Semi-Structured Questionnaire

The semi-structured questionnaire was designed and compiled to help enable the author to ascertain the prevailing situation as perceived by each of the Directorates interviewed.

1. Who, within your Directorate, is responsible for ensuring that OA and other CITCG recommendations are carried out.

2. Have you been aware of the recommendations made by the CITCG with regard to OA, and the reasons behind these.

3. Have you been aware of any improvements to service delivery, or any value and benefit that has been achieved as a result of the OA system that the Authority has implemented.

4. Has your Directorate followed the guidelines of the OA standards implemented by the CITCG:
   - which have you adopted
   - which have you not adopted, and why
   - which are you still planning to adopt at a later time.

5. Who uses OA in any way within your Directorate and how.

6. What use of OA does your Directorate use today:

   - wholly internally within the Directorate
   - to communicate and/or share work with other Directorates
   - to communicate with other Authorities and/or Central Government
   - to communicate with elected members
   - to communicate with members of the public.

7. Which OA tools does your Directorate use:

   - now
   - plans to use in the near future
   - is aware that other Directorates are using, but has no plans to use.

8. Are there any OA tools, not covered by the original OA recommendations, that you would want to use:

   - required to support other IT applications purchased
   - believe they are better than those recommended
   - are new OA tools not available at the time of the original report
   - for other reasons.

9. What is holding back further OA development within your Directorate

   - nothing
   - money
   - lack of awareness of capabilities
   - support from the IT department

- training
- incompatibility with OA tools in other parts of the Authority
- inappropriate OA standards
- other reasons.

10. What would you like to see done to improve OA usage in the next 18-24 months
    - within your Directorate
    - from and to your Directorate from any other source
    - within the Authority as a whole.

11. How has the success, or otherwise, of the OA implementation been evaluted.

12. Do you wish to add anything further.